

ABSTRACT

A mask for use in a process for curing a photosensitive material. The mask comprises a structure having a top side and a bottom side opposite to the top side, and a pattern of transparent regions and opaque regions, wherein the opaque regions comprise at least first opaque regions having a first opacity and second opaque regions having a second opacity different from the first opacity. The opaque regions can comprise a substantially continuous pattern, a substantially semi-continuous pattern, a pattern formed by a plurality of discrete areas, or any combination thereof. The opaque regions can comprise a gradient opacity that gradually changes in at least one direction. The mask can have a three-dimensional topography comprising, for example, a pattern of protrusions extending from the bottom side of the mask and/or the top side of the mask. The protrusions can form a substantially continuous pattern, a substantially semi-continuous pattern, a discrete pattern, or any combination thereof. The pattern of protrusions can correlate with the pattern of transparent and opaque regions to form a combined non-random and repeating pattern. The mask can comprise a composite structure, wherein the pattern of transparent and opaque regions can be independent and separable from the pattern of protrusions. A process for making the mask can comprise providing a thin transparent material of substantially uniform thickness, forming a pattern of opaque regions on the material according to a first predetermined pattern, and embossing the material according to a second predetermined pattern.

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